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IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers

IEEE Power and Energy Society

Sponsored by the
Transformers Committee

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3 Park Avenue
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USA

IEEE Std C57.12.90™-2015
(Revision of
IEEE Std C57.12.90-2010)

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Abstract: Methods for performing tests specified in IEEE Std C57.12.00™ and other standards applicable to liquid-immersed distribution, power, and regulating transformers are described. Instrument transformers, step-voltage and induction voltage regulators, arc furnace transformers, rectifier transformers, specialty transformers, grounding transformers, and mine transformers are excluded. Resistance measurements, polarity and phase-relation tests, ratio tests, no-load loss and excitation current measurements, impedance and load loss measurements, dielectric tests, temperature tests, short-circuit tests, audible sound level measurements, and calculated data are covered in this standard.

Keywords: IEEE C57.12.90™, tests, transformer tests, transformers

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Introduction

This introduction is not part of IEEE Std C57.12.90-2015, IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers.

This document is a voluntary consensus standard. Its use may become mandatory only when required by a duly constituted legal authority or when specified in a contractual relationship. To meet specialized needs and to allow innovation, specific changes are permissible when mutually determined by the purchaser and manufacturer, provided that such changes do not violate existing laws and are considered technically adequate for the function intended.

When this standard is used on a mandatory basis, the word “shall” indicates mandatory requirements, and the words “should” and “may” refer to matters that are recommended or permissive, but not mandatory. The word “must” has been removed from this revision and replaced with “shall” to conform with the *IEEE-SA Standards Style Manual*.

This standard is on a continuous revision cycle and is constantly being reviewed and updated. One can go to the website www.transformerscommittee.org to seek out information on select activities and participate in upcoming changes. The following is a brief summary of the non-editorial changes in this revision:

— Subclause 6.2, Polarity Tests for single-phase transformers, has been revised to remove the comparison method and the remaining methods have been re-arranged in order of preference.

— Subclause 6.3, Polarity and phase-relation tests for polyphase transformers, has been slightly revised.

— Subclause 7.1.4, Ratio test of three-phase transformers with inaccessible neutrals, has been rewritten.

— Subclause 9.5, Zero-squence impedance testing, has additional notes added.

— Subclause 10.1.5.1, Dielectric Test sequence, has been revised.

— New subclause 10.2.5, Connection of neutral terminal during switching impulse tests.

— Revisions to 10.2.1, 10.3, 10.3.2.5, and 10.3.3. The number of full wave impulses applied during the test sequence has increased from one to two or three.

— Subclause 10.3.2.4, Tap connections (during lightning impulse test), has been completely rewritten.

— Subclause 11.1, Test Methods, the order of the two simulated loading methods has been reversed.

— Subclause 11.1.2.1, Loading back method, the text, Figure 29, and Figure 30 have been revised.

— Subclause 11.2.2, Hot resistance measurements, list items a) through f) have been revised.

— Clause 12, Short-circuit tests, has been revised; and a new Annex C added on connection diagrams for short-circuit testing of a three-phase transformer using single-phase source. Multiple references are added to Annex D.

— Clause 13, Audible sound testing, has been completely revised, adding: load sound measurements; sound-intensity measurement methods; new corrections for wall reflection, near-field effects, and environmental; a method to add no-load & load sound; a change in microphone locations.

Technical revisions were prepared by various groups within the IEEE Transformers Committee and have been surveyed and approved by these groups up through the subcommittee level.